

## ESA-051-2 Louisiana Pacific (LP) Corporation – Hayward Plant Final Public Report

### Introduction:

Louisiana Pacific (LP) Corporation's Hayward WI plant receives the Wood logs and process them to manufacture the wood based building materials like Smart Side (siding product) and oriented strand board (OSB). It is one of the 30 wood processing plants operated by LP. This site utilizes the following purchased energy items; Natural gas, Fuel Oil & Electricity. The site also utilizes the following internally generated fuels; Bark & Saw Dust. The site has two almost identical production lines. The Process Heating systems to both these lines are also identical.

While the major process heating demands are managed by the internally generated fuels, purchased Natural Gas is utilized at the Thermal & Catalytic Oxidizers to avoid Toxic emissions to the environment and as the back-up fuel at the Process Heaters. Heating demand In the critical manufacturing process (Plate Press), Hot oil serves as the main heating source. Hot oil is heated at the KONUS heaters using Bark as the main fuel & Natural gas as the support fuel.

Since these KONUS heaters supply the heat for the critical process plant, it was considered for this Process heating Assessment.

### Objective of ESA:

To provide U.S. industries technical assistance targeted to reduce fuel expenditure.

### Focus of Assessment:

The focus of Energy (Steam) System Assessment (ESA) is as follows: (1) to train in-plant personnel to continue and sustain the improvement and (2) to identify energy waste reduction opportunities. This ESA is focused on the Process Heating Systems involved in the KONUS heater, Suspension Furnace that supplies the heat to Flake Dryer, Thermal Oxidizer & the Catalytic Oxidizer at the Hayward site. Three Paint drying ovens and multiple numbers of Space heaters also are in service at this site. But their impact on total fuel use is very minor and hence they were not considered for this ESA.

### Approach for ESA:

USDOE qualified specialist provided training to the plant engineers in the use of USDOE PHAST Tool and helped them in completing an initial assessment using the PHAST model developed for the KONUS heaters.

### General Observations of Potential Opportunities:

#### General Observations

The reported natural gas consumption at this site during 2006 was 230,227 MMBtu. Most of this natural gas (~90%) was consumed by the 4- Thermal & Catalytic Oxidizers to control the Volatile Organic gas emission from the process. Normal electrical demand at this unit is approximately 9 MW and all this electricity is purchased under an interruptible supply contract.

For LP's Hayward site, the reported natural gas cost during the year 2006 was \$10.06/MMBtu and the impact electricity cost was 3.21 Cents/kWh.

#### Potential energy saving opportunities

With the help of plant's engineering team, DOE's Process Heating assessment during May-07 has identified the following potential opportunities to reduce natural gas usage: They are classified as Near, Medium & Long term opportunities as defined below:

- ☐ Near term opportunities would include actions that could be taken as improvements in operating practices, maintenance of equipment or relatively low cost actions or equipment purchases.
- ☐ Medium term opportunities would require purchase of additional equipment and/or changes in the system. It would be necessary to carryout further engineering and return on investment analysis.
- ☐ Long term opportunities would require testing of new technology and confirmation of performance of these technologies under the plant operating conditions with economic justification to meet the corporate investment criteria.

**1. Recover heat from KONUS heaters to substitute the heat demands at the Ponds & Bldg. Heat during winter months:**

Stack gas temperatures at the KONUS heaters are presently maintained over 480°F, in order to maintain the Thermal oil supply at 255°C (491°F) as required by the process. However the same temperature Thermal Oil is circulated in winter months to maintain the Pond water temperature around 70°F and to heat the office buildings to comfortable working temperatures. The bark fired KONUS heaters are unable to meet this increased heat demand and forces the site to operate its back-up natural gas fired heater. These two heat loads could be managed by a lower temperature hot oil circulation that could recover additional heat from the KONUS heater's exhaust gases. Also during the ESA the flue gas Oxygen data were analyzed and found to be very high, varying between 13 to 14%. This flue gas Oxygen reading taken at the stack may include some of the false air that could have entered in the stack gas stream at the multi-clones / EFB & at the ID fan. However the fluegas Oxygen content at KONUS outlet need to be monitored and optimized regularly.

By recovering waste heat from the KONUS heaters through reducing the stack temperatures from 480°F to 300°F along with trimming the excess air levels to about 6% Oxygen in stack, LP Hayward site would save \$ 217,800 annually at the 2006 energy cost levels. (Medium term)

**2. Recycle stack gases at the two RTOs to supplement the ambient Combustion air:**

At present natural gas is burned at the RTOs to maintain the catalyst bed temperature around 1500°F to oxidize all the Volatile Organics generated in the Flake Drying process. These 6-natural gas burners use combustion air at ambient temperature supplied by a blower located at the RTO. The Dryer exhaust gases after passing through the catalyst bed are vented to atmosphere at about 220°F. The Dryer exhaust gases contain about 16 -17% Oxygen in them and hence could serve as good source of preheated Combustion air.

Hence it is recommended to recirculate part of this hot stack gases back to the burners to partially substitute the ambient combustion air supply.

Recirculating part of the stack gases at RTO back to the burners to partially substitute the combustion air at an average 212°F would save LP's Hayward site \$56,600 annually. (Medium term)

The above opportunities are identified during this Process Heating ESA, based on the available data & reasonable assumptions suggested by the plant engineers & the DOE specialist. More engineering details for this above two projects has to be worked out before implementing them as workable projects.

**3. Proper insulation and maintenance of furnace structure or parts**

The critical process step in the LP Hayward's manufacturing process is the Press operation. These Presses are heated by hot Thermal oil circulated by recovering heat at the KONUS heaters. These circulating thermal oil pipelines are well insulated except at the Press distribution manifolds. These manifolds are connected with the flexible hoses of the hot Plates, through a 3" steel pipe that is not insulated. Insulating these steel pipe sections of the hot oil manifold will save energy as well save people from burning accidents.

Insulating these bare steel pipe sections of the Press manifolds would save \$15,000 annually at LP's Hayward site. Besides this would insure work place safety for the personnel working around the Press. (Near term)

**Management Support and Comments:**

Louisiana Corporation is a well-known multinational company, with manufacturing units located at many states within USA. It is a leader in building materials manufacturing from wood & forest materials. Due to increasing energy costs and struggling building industry, cost control in manufacturing processes is a prime focus at the plant level. The management team had shown a great enthusiasm to this Energy System Assessment during the ESA. The Plant Manager entrusted his team of engineers to pursue with the recommendations further and also to look for additional energy savings opportunities in other areas as well.

**DOE Contact at Plant/Company:**

[Mike Kershaw](#), Plant Engineer, 715 634 5472. [mike.kershaw@lpcorp.com](mailto:mike.kershaw@lpcorp.com)  
16571, W US Highway 63,  
Hayward, WI-54843.